

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PC-21004510		FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/SE 2003/001295	International filing date (day/month/year) 20.08.2003	Priority date (day/month/year) 21.08.2002	
International Patent Classification (IPC) or national classification and IPC B67D 1/08, B67C 3/00, F16L 55/04			
Applicant ECO LEAN RESEARCH & DEVELOPMENT A/S et al			

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:

- a. ☒ (sent to the applicant and to the International Bureau) a total of 2 sheets, as follows:
 - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

- b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- ☒ Box No. I Basis of the report
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand 18.03.2004	Date of completion of this report 24.11.2004
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Form PCT/IPEA/409 (cover sheet) (January 2004)

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SE 2003/001295

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1 - 14 _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☒ the claims:
- pages _____ as originally filed/furnished
- pages* _____ as amended (together with any statement) under Article 19
- pages* 15 - 16 received by this Authority on 15.11.2004
- pages* _____ received by this Authority on _____
- ☒ the drawings:
- pages 1 - 4 _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-11</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-11</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-11</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

Amended claims 1-11 were filed on 16 November 2004.

Documents considered to be of particular relevance:

D1 US 6264069
D2 US 2838073
D3 GB 1550080
D4 JP 3157599

The invention relates to a device for compensating a pressure drop in a product pipe. The invention comprises a limiting means that counteracts stretching and allows free collapsing of a tube portion that is connected to the product pipe.

The cited documents have been reconsidered to represent the general state of the art. The invention defined in claims 1-11, involving a limiting means that is inelastic in the circumferential direction and collapsible together with the tube portion, is not disclosed in any of these documents.

The cited prior art does not give any indication that would lead a person skilled in the art to the claimed method and system for compensating for pressure drop in a product pipe. The ability of free collapsing is important in order to take care of a pressure drop without subjecting the tube portion to strain. It also achieves the required accuracy for discharging the product through the pipe.

Therefore, the claimed invention is not obvious to a person skilled in the art. Accordingly, the invention defined in claims 1-11 is novel and is considered to involve an inventive step. The invention is industrially applicable.

CLAIMS

1. A device (1) for compensating for pressure drop
5 in a product pipe (7) through which a liquid flows, comprising a collapsible tube portion (2) which is connect-
ible to said product pipe (7),
c h a r a c t e r i s e d b y
a limiting means (3),
10 which is inelastic in the circumferential direction
and is adapted to counteract stretching of the tube
portion (2) in the circumferential direction, and
which is flexible such that it is collapsible freely
together with the tube portion (2).

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2. A device as claimed in claim 1, wherein the
limiting means (3) is integrated into a tube wall (14)
of the tube portion (2).

20 3. A device as claimed in claim 2, wherein the
limiting means (3) comprises a reinforcement (13) inte-
grated into said tube wall (14).

25 4. A device as claimed in claim 1, wherein the
limiting means (3) is arranged outside the tube por-
tion (2).

30 5. A device as claimed in any one of the preceding
claims, wherein the limiting means (3) has such a ten-
sile strength as to prevent stretching of the tube por-
tion (2) in the circumferential direction at a pressure
above atmospheric prevailing in the same in the range of
1-10 bar.

35 6. A device as claimed in any one of the preceding
claims, further comprising a casing (4), in which said
tube portion (2) and said limiting means (3) are arrang-

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ed, pressure means (15) being arranged to apply a pressure prevailing in the casing (4), which is slightly below a normal pressure prevailing in the tube portion (2) in operation.

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7. A device as claimed in claim 6, wherein the pressure means (15) is a compressed air means (15).

8. A device as claimed in any one of the preceding claims, wherein the tube portion (2) is flexible and stretchable.

9. A system (19) for filling containers (10) with liquid contents, comprising a product pipe (7) which leads to at least one filling station (8) with at least one filling valve (9),

characterised by

a device (1) as claimed in any one of claims 1-8, which is positioned upstream of said at least one filling station (8) and connected to said product pipe (7), for compensating for pressure drop in the product pipe (7).

10. A system as claimed in claim 9, wherein the tube portion (2) is essentially linearly extended and arranged at an angle to the horizontal plane.

11. A system as claimed in claim 10, wherein said angle is in the range 5-90°, more preferably in the range 10-45°, and most preferably in the range 25-35°.

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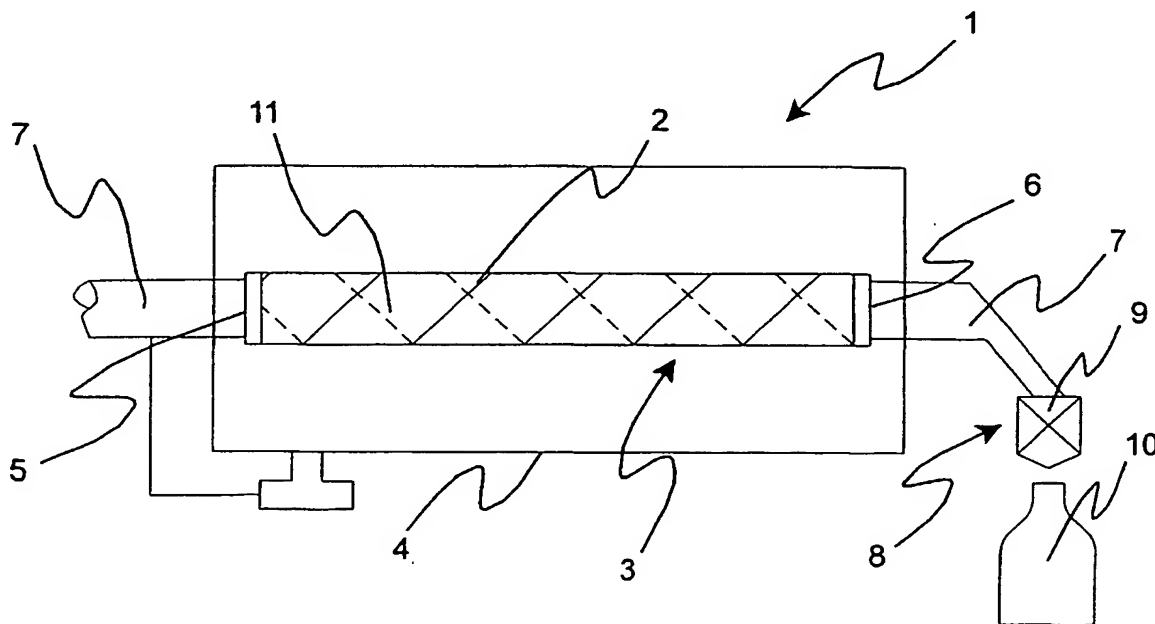
(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES,

[Continued on next page]

(54) Title: DEVICE FOR COMPENSATING FOR PRESSURE DROP



(57) Abstract: The invention relates to a device for compensating for pressure drop in a product pipe through which a liquid flows, and a system comprising such a device. The device comprises a collapsible tube portion, which is connectible to the product pipe, and is characterised by a limiting means, which is adapted to counteract stretching of the tube portion in the circumferential direction and which is adapted to allow free collapsing of the tube portion.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 2003/001295

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: B67D 1/08, B67C 3/00, F16L 55/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: B67D, B67C, F16L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6264069 B1 (ROBERT D. HUGHES ET AL), 24 July 2001 (24.07.2001), column 8, line 24 - line 26; column 9, line 21 - line 38, figures 1-6, abstract --	1-7,10-13
X	US 2838073 A (S.P. DI MATTIA ET AL), 10 June 1958 (10.06.1958), column 2, line 10 - line 12; column 3, line 25 - line 32, figures 1-4 --	1-9
Y	GB 1550080 A (TETRA PAK INTERNATIONAL AB), 8 August 1979 (08.08.1979), page 2, line 128 - line 130; page 3, line 13 - line 16, figures 1-2 --	1-13

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance
"B" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

28 January 2004

Date of mailing of the international search report

30-01-2004

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INTERNATIONAL SEARCH REPORT

Information on patent family members

06/09/03

International application No.

PCT/SE 03/01295

Patent document cited in search report			Publication date	Patent family member(s)	Publication date
US	6264069	B1	24/07/01	NONE	
US	2838073	A	10/06/58	US	2908294 A
GB	1550080	A	08/08/79	AU	511863 B
				AU	2914577 A
				CH	625191 A
				DE	2742920 A
				FR	2365745 A
				IT	1086369 B
				JP	53043219 A
				NL	7710495 A
				SE	410844 B,C
				SE	7610699 A
				SU	833175 A
GB	2103716	A	23/02/83	DE	3224250 A
US	2875786	A	03/03/59	NONE	
US	3536102	A	27/10/70	DE	1910512 A,B,C
				FR	1600645 A
				SE	345787 B
US	2735642	A	21/02/56	NONE	
US	4979441	A	25/12/90	NONE	